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DISEASES OF THE EAR, NOSE AND THROAT

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FIRST PAPER

No group of organs in the human body presents a wider variety of diseases than does the ear, nose and throat. Most of them are simple disorders which are easily cured, but certain of them are attended with great danger to life. With a few exceptions, they are neither contagious nor infectious. They may be entirely local in their manifestations or their harmful influences may extend to other organs more important than themselves. Diseases of the ear, nose and throat are to a large extent preventable and it is the author's intention to describe only those which are amenable to treatment or prevention.

The organ of hearing, familiarly known as the ear, is one of the most complex structures in the human body. Its importance, both functionally and pathologically, is out of all proportion to its size. All know of its function of hearing but comparatively few know of the function it has of maintaining the body in the erect position. The so-called semicircular canals are part of the ear. Diseased conditions of these tiny structures give rise to an intense vertigo and an inability to stand or sit erect.

For the purpose of study the ear is divided into three portions, known as the external, middle and internal ear. The external portion is called the auricle and is that structure which protrudes outward from the side of the head. In reality, it is not part of the ear at all but is a sort of hallway leading to it. Its function was doubtless to catch the sound waves and direct them to the middle ear. It is doubtful, however, if this function exists to any great extent today. The auricle is well supplied with muscles for moving it in different directions, but in most individuals the power of these muscles is lost. In prehistoric times, man doubtless moved his ears as freely as animals move theirs today. At the present time, the principal function of the auricle is to protect the delicate structures internal to it. The auricle is composed principally of cartilage and skin, though the innermost portion is composed of hard bone. The blood supply is scant. This is well illustrated by its tendency to frost-bite in cold weather. The cartilaginous rings which give it its contour or form are subject to injury and consequent deformity. The auricle is subject to different diseases and to functional disturbances from accumulations of foreign substances within its lumen.

Within the auricle is a passage leading to the middle ear which is commonly known as the "canal of the ear." It is an irregular opening nearly an inch in length and about one-quarter of an inch in circumference, in the adult. It is seldom straight in its course and is curved in one or more directions—usually downward and forward. Occasionally one can look directly into the canal and see the drum membrane; this is unusual, however. The direction of this canal is an important matter, as will be seen later.

The middle ear is a very small cavity situated, as its name would imply, between the inner and external portions of the organ. It contains the small bones of the ear with their nerves and muscles and the openings into the eustachian tube and mastoid cavity. The function of the middle ear is to transmit sound-waves from the external to the internal ear. The external wall of the middle ear is formed by a pearly white, semi-transparent structure which is familiarly known as the "drum membrane." It is commonly supposed to be a structure which is analogous to the head of a drum, whose chief duty is to vibrate. It is a question if the function of vibration is as important as it is believed to be. Many persons with imperfect drum membranes have moderately good hearing and many children hear well without any drums at all. Later in life these children lose their power of hearing to a considerable extent, not so much because of the loss of the membrane as from the scars and adhesions which form between and around the ossicles as a result of inflammatory processes.

Probably the chief value which the drum membrane possesses is that of forming a partition or curtain between the middle and external ear. This function is of great importance, for when it is absent the delicate middle ear is far more sensitive to diseased conditions. The atmospheric pressure of fifteen pounds to the square inch would drive the drum membrane inward and flatten it against the wall of the inner ear if no provision were made by nature to equalize the air pressure behind the drum. To overcome such a possibility, there is an opening which extends from the middle ear to the top of the throat which is known as the *eustachian tube.* This structure fulfills its misson perfectly in its normal state. If, for any reason, this tube ceases to perform its duty, air does not enter the middle ear cavity as freely as it should, and we find that the drum membrane is, in many instances, flattened against the wall of the inner ear. This is, perhaps, the most common cause of deafness.

The ossicles or "small bones of the ear" are three in number and are known as the hammer, anvil and stirrup. The anvil and stirrup resemble the objects from which they are named. The hammer bears no resemblance at all to the tool we use to drive nails into wooden objects, but roughly resembles a club. The small bones are joined together in a delicate manner; the hammer and anvil rotating upon each other. The tiny stirrup is joined rigidly to the anvil by a long, thin arm at one end, and to a very small second membrane covering an opening into the internal ear, at the other. The three small bones of the middle ear form a chain or bridge across that cavity to transmit the sound-waves from the external to the internal ear. The integrity of the drum membrane is far less essential to good hearing than is the perfect working of this chain of bones. Destruction of the ossicles is followed by a loss of hearing which is difficult to restore.

The anatomy and physiology of the internal ear is so intricate no description at all will be given in this paper. Its function is to transmit the sound-waves from the middle ear to the centre of hearing in the brain. The latest scientific discoveries in otology lie in this field. Fortunately, diseased conditions of this portion of the organ of hearing are so rare they need not be considered in a paper of this kind.

Before taking up the true diseases of the ear, let us briefly consider two common causes of disturbed function which are not in any sense due to pathological conditions.

Patients often consult their physicians because of their inability to hear accustomed sounds. Examination quickly reveals the external auditory canal to be filled with cerumen or "ear wax." This is a normal secretion of the tiny glands which are situated within the auditory canal. Its presence is necessary for the comfort and cleanliness of the individual. Its function is to moisten the canal and to gather within itself the dust and small foreign bodies which naturally find their way to this location. In elderly people cerumen is frequently absent and they are often distressed with a sensation of itching or burning as a result of it. In consistency, cerumen resembles soft wax and its color varies from a light yellow to a dark brown. In the average individual, the secretion and expulsion of cerumen is an automatic procedure largely brought about by the movements of the jaws. The ordinary methods of cleaning the ears have little or nothing to do with it. Overzealous persons attempt to remove the wax by inserting pointed objects covered with cotton or cloth. Instead of removing it, this effort on their part simply pushes the cerumen further into the canal to a point where the natural methods of expulsion fail to reach it. Nothing smaller than the little finger covered with a cloth should ever be used for the purpose of cleaning the ears.

In certain individuals the contour of the canal is such that the cerumen is not automatically removed. With them, the wax accumulates until the canal becomes entirely filled. When the sound-waves can no longer reach the drum membrane, deafness more or less pronounced results. When water comes in contact with large masses of cerumen, they are apt to swell. For this reason deafness is liable to develop suddenly while washing the ears. When it occurs, patients are very much disturbed until they learn the true nature of their loss of hearing.

Removing cerumen is not as easy as one might suppose. Even to a skilled specialist it is often a tedious task to perform. Masses of long standing have moulded themselves tightly into the canal and have glued themselves to its walls. In many instances, considerable damage has been done to the delicate tissues in the vicinity by unskilfull efforts to remove it. One who is not reasonably familiar with the procedure should not attempt it. Accumulated cerumen should always be syringed out. No other method is attended with safety even in the hands of specialists. It often requires twenty minutes or longer to accomplish the desired result. It is a long drawn-out process with anything but a specially constructed syringe, and taxes the patience of both patient and physician. Syringes designed for this purpose are made of metal and arranged to be worked with one hand. They hold from four to eight ounces of water and it is highly desirable that the piston should slide easily in the barrel. Fountain syringes and small glass instruments of the kind are useless for the purpose. A syringe which requires the use of two hands for its manipulation is hopeless. The proper methods to be employed in syringing the ear will be taken up later. Instruments of any kind should never be employed for the removal of cerumen. To attempt to grasp the mass with forceps is a dangerous procedure. Masses of cerumen of long standing are apt to be quite hard at the end which is next the drum. If the canal is entirely filled, the inner end of the mass may be in contact with the drum. Any attempt to force it out of its position may rupture the drum membrane. Moreover, instrumental removal, if the cerumen is at all hard, is very painful to the patient. The most dangerous instrument used for the purpose is a small hook which is on sale in the instrument stores. This hook is dangerous, even in the hands of skilled specialists, and its use should be only a last resort.

Foreign bodies in the external auditory canal are not especially uncommon. All manner of small objects have been taken from children's ears. Glass beads seem to be the favorites. Peas, beans, cherry stones, small pebbles, wads of paper and cotton, etc., are not uncommonly found in this location. The writer has in his possession, a common pin nearly an inch in length which he removed from the ear of an eight year old boy. It had remained partly in the ear and partly down the eustachian tube for four years. The boy was not at all surprised when the pin was shown to him. When it was suspected to be in the ear, he was taken to a physician to have it removed. The physician made an examination and denied its presence in the ear. The case illustrates the importance of making a thorough search for foreign bodies when their presence is suspected. The failure to locate this pin caused the patient to entirely lose the hearing on that side.

A glass bead, fresh cherry stone or a smooth white bean, snugly fitted into the canal, presents about as great a problem for removal as can be imagined. Rough or irregular surfaced objects do not, as a rule, present so great a difficulty. Foreign bodies in the canal which cannot be removed by syringing are very difficult and dangerous to remove. Physicians who have had no special experience with aural surgery should not attempt it. The writer was recently called to a case where three previous attempts had been made by the family physician to remove what was supposed to be a glass bead from a baby's ear. With the child in the sitting position nothing could be seen in the canal. The drum had been entirely destroyed and the little bones of the middle ear were missing, because of the previous attempts to remove the foreign body. Upon flexing the child's head strongly to one side, a large foreign body was seen high up in the attic of the middle ear. It was removed without great difficulty and proved to be a shoe button instead of a glass bead. This case is mentioned to illustrate the danger attending the removal of foreign bodies from the ear.

When an attempt to remove a foreign body from a child's ear is made, the child should be wrapped tightly in many folds of a blanket or sheet, extending from the neck to the heels, in such a manner as to render it impossible for him to move. If this does not suffice to hold the child motionless, full ether anesthesia should be resorted to. It is the sudden, twisting movements on the part of the patient which usually cause damage to the delicate structures. Occasionally foreign bodies which do not fit tightly into the canal can be shaken out of the ear by holding the head on the affected side, parallel with the floor, and gently shaking the child's head up and down. This simple method is, of course, not attended with any danger and may be tried by any intelligent person.

Large insects have been known to find their way into the external auditory canal. This is not an unusual motoring accident. A large winged insect will cause a highly disagreeable sensation in the canal of a nervous person as it thrashes its legs and wings about in its efforts to escape. Syringing the ear with water often fails to remove it and only serves to make its movements more violent. A few drops of any clean oil will instantly kill the insect and its subsequent removal will be easy by syringing out the dead body.

Diseases of the external ear are more or less common. Only two of them will be mentioned, as the remainder are relatively infrequent or unimportant. Eczema of the auricle, so-called, closely resembles eczema in other parts of the body. It probably is not a true eczema as it yields to simple treatment far more easily than does the disease in other locations. It occurs most frequently in the groove behind the auricle where that structure joins the side of the head. In children who have a discharge from the ear, this disease is apt to appear around the mouth of the canal and upon the anterior face of the auricle. Like eczema in other parts of the body, it often does not tolerate the presence of water. Oily or greasy preparations help the condition. If the affected parts are cleaned with olive oil or petrolatum, instead of water, and if the surface is kept moist with some greasy ointment for a few days, the condition will usually clear up, more or less permanently. Usually, though not always, persons who have eczema of the auricle do not suffer from the disease in other parts of the body. When it is present in other parts, eczema of the auricle is a more serious matter and does not yield so readily to treatment.

A second disease of the auricle which is very common is external otitis. This is an infection of the lining membrane of the canal. It is seen more often among women than among men. It is essentially a disease of hairpins, toothpicks and lead pencils. These pointed articles of every-day use are introduced into the canal for the purpose of scratching it; infection follows. When the disease is at its height, the condition is often analogous to a collection of boils, so arranged in a circle as to press one upon another. It is a very painful disease and one which does not yield quickly to treatment. The diagnosis is comparatively simple. The cardinal symptom is pain upon the slightest movement of the auricle, together with a swelling of the mouth of the canal, which is exquisitely tender to pressure. Great care must be exercised in making an examination, as considerable discomfort is given the patient by even the most gentle manipulation. A differential diagnosis is easily made between this disease and acute middle ear abscess and mastoiditis, by the absence of tenderness upon moving the auricle in the latter two diseases. During the acute process of the disease the pain is intense and continuous and is likely to persist for some time, in spite of any treatment available. The pain of both middle ear abscess and mastoiditis is often more easily controlled than that of external otitis. If seen in the early stages, the canal will be found to be red and swollen, and the swelling at this time will be firm to the touch. Later, the swelling will fluctuate upon pressure at one or more points. This is due to the formation of free pus within the tissues and is the beginning of the process of resolution.

In the early stages the patient should be put to bed, if possible, and a thorough catharsis given. Applications of heat or cold are often comforting. Ice bags occasionally give great relief from the pain; heat, on the other hand, will hasten resolution. Poultices are often used and in severe cases are advisable. Hot irrigations do little good as they cannot penetrate far into the swollen canal. Formerly a solution of carbolic acid in glycerine was used considerably; it often fails to relieve. A saturated solution of aluminum acetate continuously applied on cotton appears to abort a certain number of cases, if used early. Many specialists advise incision of the swelling in the early stages. Others advise waiting until fluctuation appears. The author believes that to incise the canal before free pus exists, not only does no good, but actually makes the condition worse by carrying the infection deeper into the tissues, in many instances. Repeated attacks of this disease may be indicative of diabetes, but more often it is simply the result of careless habits.

Injuries to the auricle require careful treatment. Cuts or tears should be carefully cleansed and accurately stitched together. Ill-shaped auricles occasionally cause great mental distress to their unfortunate possessors. One young boy, in the writer's experience, absolutely refused to attend school any longer because the other children plagued him beyond endurance. His ears were very large and broad and gave him a grotesque appearance. At the request of the boy and his parents, he was admitted to the hospital. Under a general anesthetic we removed a considerable amount of tissue and literally took a reef in his ears. In due course of time he returned to school having practically lost all of the deformity.

The writer does not believe in beauty operations and refuses to perform them upon the nose and face if it can be avoided. Marked aural deformities, however, when they occur in sensitive children, may be regarded as a menace to the child's happiness, and surgical interference is justified in many cases. No beauty operations should be encouraged to satisfy vanity alone. They do not always end well and the patient and friends never forgive the operator in the event of failure.